

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Francesca Pignagnoli, et al.

Serial No. 10/539,961

Art Unit: 1796

Filed: June 17, 2005

Examiner: John M. Cooney

For: POLYOL COMPOSITION AND POLYISOCYANATE-BASED FOAM PREPARED
THEREFROM

REPLY BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Reply Brief is filed in reply to Examiner's Answer of May 13, 2008. A Notice of Appeal, a one-month extension of time, an Appeal Brief, and a Request for Oral Hearing accompanied with the required fees have already been filed.

The Applicant further requests a date for an Oral Hearing. The fees required under Sections 1.17(a)(1), 41.20(b)(1), and 41.20(b)(3) have already been paid on February 8, 2008. The fees required under Section 41.20(b)(2) have already been paid on April 8, 2008. The director is hereby authorized to charge any additional fees to the Deposit Account No. 04-1512.

REAL PARTY IN INTEREST

The real party in interest is The Dow Chemical Company, the assignee of record in the instant application.

I. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

II. STATUS OF THE CLAIMS

Claims 1, 8-15, 19, 20, and 22-25 stand rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow"). Furthermore, Claims 1, 8-15, 19, 20, and 22-25 are the subject of this Appeal.

III. STATUS OF AMENDMENTS

No Claim was amended after the Final Rejection and prior to this Appeal.

IV. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following is a concise explanation of the subject matter defined in independent Claims 1, 13-14, 19, and 22-23.

According to Claim 1, the instant invention is a polyol composition suitable for preparation of rigid polyisocyanate-based

foam. (Specification, Page 3, Lines 1-5). The polyol composition comprises (a) a blowing agent comprising formic acid (Specification, Page 3, Lines 1-5), wherein the formic acid comprises 1.5 to 3.5 parts per 100 parts by weight of the polyol composition (Specification, Page 5, Lines 1-3); (b) an aromatic polyol comprising an aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of phenol with an aldehyde (Specification, Page 3, Lines 1-5), wherein the aromatic polyoxyalkylene polyol comprising at least 20 weight percent based on the total weight of the polyol composition (Specification, Page 4, Lines 25-30); and (c) a physical blowing agent, wherein said physical blowing agent comprising 4 to 10 parts per 100 parts by weight of said polyol composition, and wherein said physical blowing agent being a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, heptane, and isomers thereof (Specification, Page 5, Lines 14-17 and 25-30).

According to Claim 13, the instant invention is a polyurethane foam obtained by bringing together under foam-forming conditions a polyisocyanate with a polyol composition characterized in that:

a) the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from 80 to 150; and

b) the polyol composition comprises (i) formic acid, wherein said formic acid comprising 1.5 to 3.5 parts per 100 parts by weight of said polyol composition including said formic acid; (ii) an aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of a phenol with an aldehyde, wherein said aromatic polyoxyalkylene polyol comprising at least 20 weight percent based on total weight of the polyol composition; and (iii) a physical blowing agent, wherein said physical blowing agent comprising 4 to 10 parts per 100 parts by weight of said polyol composition, and wherein said physical blowing agent being a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, heptane, and isomers thereof. (Specification, Page 3, Lines 13-21; Page 4, Lines 25-30; and Page 5, Lines 1-3, 14-17, and 25-30).

The instant invention according to Claim 14 is a polyisocyanurate foam obtained by bringing together under foam-forming conditions a polyisocyanate with a polyol composition characterized in that:

a) the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from 150 to 600; and

b) the polyol composition comprises (i) formic acid, wherein said formic acid comprising 1.5 to 3.5 parts per 100 parts by weight of said polyol composition including said formic acid;

(ii) an aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of a phenol with an aldehyde, wherein said aromatic polyoxyalkylene polyol comprising at least 20 weight percent based on total weight of the polyol composition; and (iii) a physical blowing agent, wherein said physical blowing agent comprising 4 to 10 parts per 100 parts by weight of said polyol composition, and wherein said physical blowing agent being a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, heptane, and isomers thereof. (Specification, Page 3, Lines 13-21; Page 4, Lines 25-30; and Page 5, Lines 1-3, 14-17, and 25-30).

The instant invention according to Claim 19 is a process for preparing a closed-celled polyisocyanurate foam by bringing into contact under foam-forming conditions a polyisocyanate with a polyol composition in the presence of a blowing agent mixture wherein the polyol composition comprises an aromatic polyester polyol and an aromatic polyether polyol and wherein the blowing agent mixture comprises formic acid and a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, and heptane, and the isomers thereof, said formic acid comprising 1.5 to 3.5 parts per 100 parts by weight of said polyol composition including said formic acid, wherein said physical blowing agent comprising 4 to 10 parts per 100 parts by weight of said polyol composition, and characterized in that the

polyisocyanate is present in an amount to provide for an isocyanate reaction index of from greater than 150 to about 600.

(Specification, Page 3, Line 23 to Page 4, Line 2; Page 4, Lines 25-30; and Page 5, Lines 1-3, 14-17, and 25-30).

The instant invention according to Claim 22 is a two component foam forming system comprising:

a) an aromatic polyisocyanate having an average of from 2.8 to 3.2 isocyanate groups per molecule; and

b) a polyol composition that contains: (i) an aromatic polyester polyol and an aromatic polyether polyol based on an initiator obtained from the condensation of a phenol with an aldehyde, wherein said aromatic polyoxyalkylene polyol comprising at least 20 weight percent based on total weight of the polyol composition; and (ii) a blowing agent mixture comprising formic acid and a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, and heptane, and the isomers thereof, wherein said formic acid comprising 1.5 to 3.5 parts per 100 parts by weight of said polyol composition including said formic acid, and wherein said physical blowing agent comprising 4 to 10 parts per 100 parts by weight of said polyol composition. (Specification, Page 3, Lines 6-9; Page 4, Lines 25-30; and Page 5, Lines 1-3, 14-17, and 25-30).

The instant invention according to Claim 23 is a method of improving fire retardancy of a polyisocyanate-based foam comprising the steps of:

providing a polyol composition comprising;

a) blowing agent comprising formic acid, wherein said formic acid comprising 1.5 to 3.5 parts per 100 parts by weight of said polyol composition including said formic acid;

b) an aromatic polyol comprising an aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of a phenol with an aldehyde, wherein said aromatic polyoxyalkylene polyol comprising at least 20 weight percent based on total weight of the polyol composition; and

c) a physical blowing agent, wherein said physical blowing agent being a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, heptane, and isomers thereof, and wherein said physical blowing agent comprising 4 to 10 parts per 100 parts by weight of said polyol composition;

providing a polyisocyanate;

bringing together under foam-forming conditions said polyol composition and said polyisocyanate; and

thereby forming a polyisocyanate-based foam having an improved fire retardancy. (Specification, Page 3, Lines 10-12; Page 4, Lines

25-30; Page 5, Lines 1-3, 14-17, and 25-30; and Page 17, Lines 8-10).

V. GROUND'S OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, and 8-12 stand rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow").

Claim 13-15 stands rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow").

Claims 19 and 20 stand rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow").

Claim 22 stands rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow").

Claims 23-25 stand rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow").

VI. ARGUMENT

Claims 1, 8-15, 19, 20, and 22-25, for the reasons explained hereinafter, are not obvious under 35 U.S.C. 103(a); thus, the above-mentioned 103 rejections are improper, and they must be removed.

A. CLAIMS 1, AND 8-12 ARE NON-OBVIOUS UNDER 35 U.S.C. 103(a)

Claims 1, and 8-12 are non-obvious under 35 U.S.C. 103(a) over the U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow") for the reasons stated below.

First, in response to the Examiner's Answer, the Applicant reasserts the same arguments provided in the Appeal Brief filed on April 8, 2008.

Second, in further response to the Examiner's argument, i.e. "Accordingly, it would have been obvious for one having ordinary skill in the art to have employed the formic acid of Hickey et al. in the preparations of Hickey et al. for the purpose of imparting their foam enhancing and producing effects in order to arrive at the products and process of the appellant's claims with the expectation of success in the absence of showing new or unexpected results., (Examiner's Answer, Page 4, Lines 8-15)," the Examiner is in error because the Applicant has already shown unexpected results, i.e. improved fire retardation and smoke properties (See Appeal Brief, Page 13, Line 20 to Page 17, Line 16).

Third, in further response to the Examiner's argument, i.e. "a *prima facie* case of obviousness exist where the proportions of a reference are close enough to those of the claims to lead to an expectation of the same properties, (Examiner's Answer, Page 6, Lines 7-10)," the Examiner has failed to provide the basis for his argument because the Examiner has failed to show why such

requirements would lead to improved fire retardation and smoke properties.

Fourth, with regard to the unexpected results, the Examiner has failed to show any evidence contrary to the Applicant's showing, other than conclusive statements.

Fifth, in further response to the Examiner's argument regarding non-obviousness, i.e. "one cannot show non-obviousness by attacking reference individually where the rejections are based on combinations of references (Examiner's Answer, Page 8, Lines 8-11)," the Examiner is in error, because the Applicant has clearly shown and stated in his Appeal Brief that "the teachings of Hickey or Chow, **alone or in combination**, fail to teach all of the required elements of the instant invention."

Accordingly, the instant invention, as described in Claim 1, is non-obvious over the U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow").

Finally, if an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F. 2d 1071 (Fed. Cir. 1988). Claims 8-12 depend from Claim 1; thus, Claims 8-12 are non-obvious.

Accordingly, the above-mentioned rejections should be removed.

B. CLAIMS 13-15 ARE NON-OBVIOUS UNDER 35 U.S.C. 103(a)

Furthermore, the instant invention, as described in Claims 13-15 are non-obvious under 35 U.S.C. 103(a) over the U.S. Patent No.

6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow") non-obvious for the reasons stated above with regard to the instant invention, as described in Claim 1.

C. CLAIMS 19-20 ARE NON-OBVIOUS UNDER 35 U.S.C. 103(a)

Furthermore, the instant invention, as described in Claims 19-20 are non-obvious under 35 U.S.C. 103(a) over the U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow") non-obvious for the reasons stated above with regard to the instant invention, as described in Claim 1.

D. CLAIM 22 IS NON-OBVIOUS UNDER 35 U.S.C. 103(a)

Furthermore, the instant invention, as described in Claim 22 is non-obvious under 35 U.S.C. 103(a) over the U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow") non-obvious for the reasons stated above with regard to the instant invention, as described in Claim 1.

E. CLAIMS 23-25 ARE NON-OBVIOUS UNDER 35 U.S.C. 103(a)

Furthermore, the instant invention, as described in Claims 23-25 are non-obvious under 35 U.S.C. 103(a) over the U.S. Patent No. 6,359,022 ("Hickey") in view of the U.S. Patent No. 3,842,036 ("Chow") non-obvious for the reasons stated above with regard to the instant invention, as described in Claim 1.

F. CONCLUSION

In view of the foregoing, Applicant respectfully requests an early Notice of Allowance in this application.

Respectfully submitted,

/Ray Ashburg/
Registration No. 53,956

Dated: June 13, 2008